

Appln. No. 10/773,648
Amendment
Reply to Office Action dated December 16, 2004

Docket No. 200-89

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising
- [[-]] a spindle having a longitudinally extending thread,
 - [[-]] housing,
 - [[-]] a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and
 - [[-]] a worm wheel that is arranged within the housing, is rotatable within the housing and comprises of a worm gear that meshes with the external teeth of the spindle nut,

wherein the spindle gear further comprises at least one of the following features a) to g):

- a) ~~that the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, that a bearing shell is provided that comprises an internal bearing surface cooperating with the external bearing surface, that the bearing shell comprises a slot and that the bearing shell is inserted within the housing so as to be secured against torsion;~~
- b) ~~that the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;~~
- e) ~~that the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, that a stop disk is provided that is attached to said external bearing surface so as to surround it, and that the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;~~
- d) ~~that the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, that a stop disk is provided that is attached to said external bearing surface so as to surround it and that the stop disk comprises a slide lacquer coat;~~
- e) ~~that the housing is composed of at least two housing parts that are made of zinc diecasting;~~
- f) ~~that the external teeth of the spindle nut are made as a globoidal gear; and~~

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g) ~~that the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof.~~

2. (Original) The spindle gear according to claim 1, wherein the outer bearing surface of the spindle nut is cylindrical and two bearing surfaces are provided, the external teeth being located between the two bearing surfaces.

3. (Original) The spindle gear according to claim 1, wherein the bearing shell has an outer border and the housing forms a receiving groove mating with said outer border.

4. (Original) The spindle gear according to claim 1, wherein the bearing shell forms a radially projecting lug and the housing forms a recess for receiving said lug.

5. (Currently amended) A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising

a spindle having a longitudinally extending thread,

a housing,

a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and

a worm wheel that is arranged within the housing, is rotatable within the housing and comprises a worm that meshes with the external teeth of the spindle nut,

wherein the spindle gear further comprises at least one of the following features a) to g):

a) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a bearing shell is provided that comprises an internal bearing surface cooperating with the external bearing surface, the bearing shell comprises a slot and that the bearing shell is inserted within the housing so as to be secured against torsion;

b) the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;

c) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface

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- so as to surround it, the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;
- d) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it and the stop disk comprises a slide lacquer coat;
- e) the housing is composed of at least two housing parts that are made of zinc diecasting;
- f) the external teeth of the spindle nut are made as a globoidal gear; and
- g) the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof, and
wherein The spindle gear according to claim 1, wherein the external teeth of the spindle nut,
as viewed in axial section, have a substantially axially oriented central contour line having a right side and a left side, a left curved contour line adjoining on the left side and a right curved contour line adjoining on the right side, the axial length of the left curved contour line and the right curved contour line is greater than the axial length of the central contour line.

6. (Original) The spindle gear according to claim 1, wherein the spindle gear is for a lengthwise adjustment device of a motor vehicle seat.

7. (Currently amended) ~~The spindle gear according to claim 1,~~ A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising
a spindle having a longitudinally extending thread,
a housing,
a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and
a worm wheel that is arranged within the housing, is rotatable within the housing and comprises a worm that meshes with the external teeth of the spindle nut,
wherein the spindle gear further comprises at least two of the following features a) to g):
a) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a bearing shell is provided that comprises an internal bearing surface

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- cooperating with the external bearing surface, the bearing shell comprises a slot and the bearing shell is inserted within the housing so as to be secured against torsion;
- b) the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;
 - c) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it, the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;
 - d) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it and the stop disk comprises a slide lacquer coat;
 - e) the housing is composed of at least two housing parts that are made of zinc diecasting;
 - f) the external teeth of the spindle nut are made as globoidally shaped teeth; and
 - g) the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof.

8. (Currently amended) The spindle gear according to claim 1, A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising
a spindle having a longitudinally extending thread,
a housing,
a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and
a worm wheel that is arranged within the housing, is rotatable within the housing and comprises a worm that meshes with the external teeth of the spindle nut,

- wherein the spindle gear further comprises at least three of the following features a) to g):
- a) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a bearing shell is provided that comprises an internal bearing surface cooperating with the external bearing surface, the bearing shell comprises a slot and the bearing shell is inserted within the housing so as to be secured against torsion;

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- b) the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;
- c) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it, the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;
- d) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it and the stop disk comprises a slide lacquer coat;
- e) the housing is composed of at least two housing parts that are made of zinc diecasting;
- f) the external teeth of the spindle nut are made as globoidally shaped teeth; and
- g) the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof.

9. (Currently amended) ~~The spindle gear according to claim 1,~~ A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising
a spindle having a longitudinally extending thread,
a housing,
a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and
a worm wheel that is arranged within the housing, is rotatable within the housing and comprises a worm that meshes with the external teeth of the spindle nut

wherein the spindle gear further comprises at least four of the following features a) to g):

- a) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a bearing shell is provided that comprises an internal bearing surface cooperating with the external bearing surface, the bearing shell comprises a slot and the bearing shell is inserted within the housing so as to be secured against torsion;
- b) the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;

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- c) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it, the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;
- d) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it and the stop disk comprises a slide lacquer coat;
- e) the housing is composed of at least two housing parts that are made of zinc diecasting;
- f) the external teeth of the spindle nut are made as globoidally shaped teeth; and
- g) the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof.

10-11. (Cancelled)

12. (Original) The spindle gear according to claim 1, wherein the projection engages between two neighboring teeth of the external teeth of the spindle nut.

13. (Currently amended) ~~The spindle gear according to claim 1,~~ A spindle gear for an adjusting device in a motor vehicle seat, said spindle gear comprising
a spindle having a longitudinally extending thread,
a housing,
a spindle nut, which is arranged within the housing, is rotatable within the housing, has an internal thread matching the thread of the spindle and comprises external teeth, and
a worm wheel that is arranged within the housing, is rotatable within the housing and comprises a worm that meshes with the external teeth of the spindle nut,

wherein the outer diameter increases from the axial center of the external teeth of the spindle nut towards the axial regions of the external teeth in the form of a curve and

wherein the spindle gear further comprises at least one, of the following features a) to g):

- a) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a bearing shell is provided that comprises an internal bearing surface

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- cooperating with the external bearing surface, the bearing shell comprises a slot and that the bearing shell is inserted within the housing so as to be secured against torsion;
- b) the spindle nut comprises a slide lacquer coat, said slide lacquer coat being provided on at least one of the external teeth and on the internal thread;
 - c) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it, the stop disk has a projection which engages into a corresponding recess of the spindle nut and forms an antirotation lock;
 - d) the spindle nut comprises at least one external bearing surface that is axially offset relative to the external teeth, a stop disk is provided that is attached to said external bearing surface so as to surround it and the stop disk comprises a slide lacquer coat;
 - e) the housing is composed of at least two housing parts that are made of zinc diecasting;
 - f) the external teeth of the spindle nut are made as a globoidal gear; and
 - g) the external teeth of the spindle nut have an outer diameter that is smallest in the region of the axial center thereof and that increases toward the axial end regions thereof.